

WE CLAIM:

1. A header for connecting an electronic components board to a circuit board, comprising:

5           a plurality of side walls joined together to form a planar frame around an area substantially the same as the area of said components board, said frame having first and second surfaces;

10          said side walls made of plastic material unwarpable at assembly temperatures, and having a thickness suitable for tolerating process-induced stresses;

15          a plurality of geometric features in said first surface, suitable for aligning said frame to said components board;

20          selected side walls having a plurality of openings extending from said first to said second surface;

25          a plurality of metal pins intended for assembly to said circuit board, each of said pins having a first end and a second end;

30          said first end of each of said pins located in one of said openings, respectively, such that it extends a pre-determined length from said first surface, said length equal for each of said pins;

and

35          said second end of each of said pins protruding from said second surface.

2. The header according to Claim 1 wherein said frame has four side walls joined together to form a rectangle.

30 3. The header according to Claim 1 wherein said second ends of said pins are configured to connect to circuit boards by through-hole attachment or, after forming, by

- surface-mount attachment.
4. The header according to Claim 1 wherein each of said first ends of said pins protrudes a length of about 0.3 to 0.4 mm.
- 5 5. The header according to Claim 1 wherein said first ends of said pins have surfaces wettable by solder.
6. The header according to Claim 1 wherein said plastic material of said frame is DMS Stanyl TE250F6.
7. The header according to Claim 6 wherein a molding process is used to fabricate said frame.
- 10 8. The header according to Claim 1 wherein said side wall thickness is in the range from about 0.9 to 1.2 mm for side walls without pin openings, and from about 2.7 to 3.0 mm for side walls with pin openings.
- 15 9. The header according to Claim 1 wherein said geometrical features are plastic bumps extending from said first surface.
10. The header according to Claim 1 wherein said geometrical features are dimples in said first surface.
- 20 11. The header according to Claim 1 further having a plurality of plastic frame parts spacing said header from said circuit board.
12. The header according to Claim 1 further having a tab attached to said side walls, said tab suitable for handling said frame by pick-and-place machines and removable after said handling.
- 25 13. The header according to Claim 12 wherein said tab has an outline for identifying orientation of said header in pick-and-place machines.
- 30 14. A method for assembling a header and an electronic components board, comprising the steps of:  
providing a header having plastic side walls joined

together forming a frame having a planar surface, a plurality of plastic bumps extending from said surface, and a plurality of metal pins, located in said frame, having one end extending from said surface;

placing solder paste on said extending pin ends; providing an electrically insulating assembly board having top and bottom surfaces, each surface having metallic terminals interconnected by conductive routing lines integral with said board, said bottom surface further having dimples matching said plastic bumps;

aligning said terminals on said bottom board surface  
with said extending pin ends, and said dimples  
with said bumps;

contacting said bottom board surface with said solder paste on said extending pin ends, concurrently inserting said plastic bumps into said dimples;

placing solder paste on said terminals on said top board surface;

providing selected electronic components;

aligning said components with matching terminals on  
said top board surface;

contacting said components with said solder paste of  
said matching terminals;

increasing the temperature to reflow said solder paste between said pin ends and said bottom terminals, and concurrently between said

components and said top terminals; and  
cooling the temperature for solidifying said solder,  
thereby completing said assembly.

15. The method according to Claim 14 wherein said solder paste is selected such that its reflow temperature is higher than the solder reflow temperature employed for circuit board assembly.